

EXHIBIT 17

U.S. Patent No. 7,490,155

Claim 1	Identification
<p>1[pre]. A method for controlling a media session having at least two transactions comprising:</p>	<p>Defendants operate an IP Multimedia Subsystem (IMS)</p> <p>To the extent the preamble is limiting, IMS mobile origination, for example, practices a method for controlling a media session having at least two transactions:</p> <p>“4.6.1 Proxy-CSCF</p> <p>The Proxy-CSCF (P-CSCF) is the first contact point within the IM CN subsystem. Its address is discovered by UEs using the mechanism described in the clause "Procedures related to Local CSCF Discovery". The P-CSCF behaves like a Proxy (as defined in IETF RFC 3261 [12] or subsequent versions), i.e. it accepts requests and services them internally or forwards them on. The P-CSCF shall not modify the Request URI in the SIP INVITE message. The P-CSCF may behave as a User Agent (as defined in the IETF RFC 3261 [12] or subsequent versions), i.e. in abnormal conditions it may terminate and independently generate SIP transactions.”</p> <p>3GPP TS 23.228 V18.0.0 (2022-12) p. 49.</p>

5.6.2 (MO#2) Mobile origination, home

This origination procedure applies to users located in their home service area.

The UE is located in the home network, and determines the P-CSCF via the CSCF discovery procedure described in clause 5.1.1. During registration, the home network allocates an S-CSCF in the home network.

When registration is complete, P-CSCF knows the name/address of S-CSCF.

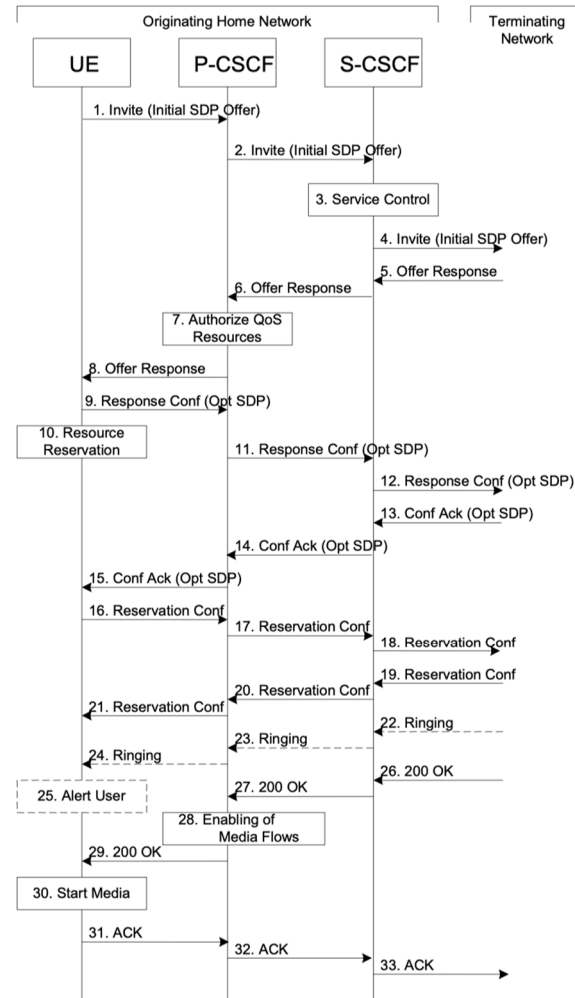


Figure 5.15: Mobile origination procedure - home

Claim 1	Identification
	<p>“Procedure MO#2 is as follows:</p> <ol style="list-style-type: none"> 1. UE#1 sends the SIP INVITE request, containing an initial SDP, to the P-CSCF determined via the CSCF discovery mechanism. The initial SDP may represent one or more media for a multi-media session. 2. P-CSCF remembers (from the registration procedure) the next hop CSCF for this UE. In this case it forwards the INVITE to the S-CSCF in the home network. <p>P-CSCF determines whether the INVITE message requires priority handling based on user profile stored during the registration procedure and/or the priority requested by the user and/or MPS code/identifier included in the INVITE message. If the session is determined to require priority handling, then P-CSCF inserts/replaces the priority indication and forwards the INVITE to the S-CSCF.</p> <ol style="list-style-type: none"> 3. S-CSCF validates the service profile, if a GRUU is received as the contact, ensures that the Public User Identity of the served user in the request and the Public User Identity associated with the GRUU belong to the same service profile, and invokes any origination service logic required for this user. This includes authorization of the requested SDP based on the user's subscription for multi-media services. If the Request URI contains the SIP representation of an E.164 address then the procedure specified in clause 4.3.5.3 applies. 4. S-CSCF forwards the request, as specified by the S-S procedures. When the INVITE message includes priority indication, the S-CSCF forwards the INVITE, including the Service User's priority level if available. 5. The media stream capabilities of the destination are returned along the signalling path, per the S-S procedures. 6. S-CSCF forwards the Offer Response message to P-CSCF. 7. P-CSCF instructs the PCRF/PCF to authorize the resources necessary for this session.

Claim 1	Identification
	<p>8. P-CSCF forwards the Offer Response message to the originating endpoint.</p> <p>9. UE decides the offered set of media streams for this session, confirms receipt of the Offer Response and sends the Response Confirmation to P-CSCF. The Response Confirmation may also contain SDP. This may be the same SDP as in the Offer Response received in Step 8 or a subset. If new media are defined by this SDP, a new authorization (as in Step 7) will be done following Step 14. The originating UE is free to continue to offer new media on this operation or on subsequent exchanges using the Update method. Each offer/answer exchange will cause the P-CSCF to repeat the Step 7 again.</p> <p>10. Depending on the bearer establishment mode selected for the IP-CAN session, resource reservation shall be initiated either by the UE or by the IP-CAN itself. The UE initiates resource reservation procedures for the offered media as shown in Figure 5.15. Otherwise, the IP-CAN initiates the reservation of required resources after step 7.</p> <p>11. P-CSCF forwards this message to S-CSCF.</p> <p>12. S-CSCF forwards this message to the terminating endpoint, as per the S-S procedure.</p> <p>13-14. The terminating end point responds to the originating end with an acknowledgement. If Optional SDP is contained in the Response Confirmation, the Confirmation Acknowledge will also contain an SDP response. If the SDP has changed, the PCSCF authorizes the media.</p> <p>15. PCSCF forwards the answered media towards the UE.</p> <p>16-18. When the resource reservation is completed, UE sends the successful Resource Reservation message to the terminating endpoint, via the signalling path established by the INVITE message. The message is sent first to P-CSCF.</p>

Claim 1	Identification
	<p>19-21. The terminating end point responds to the originating end when successful resource reservation has occurred.</p> <p>If the SDP has changed, the P-CSCF again authorizes that the resources are allowed to be used.</p> <p>22-24. The destination UE may optionally perform alerting. If so, it signals this to the originating party by a provisional response indicating Ringing. This message is sent to S-CSCF per the S-S procedure. It is sent from there toward the originating end along the signalling path.</p> <p>25. UE indicates to the originating user that the destination is ringing.</p> <p>26-27. When the destination party answers, the terminating endpoint sends a SIP 200-OK final response along the signalling path to the originating end, as specified by the termination procedures and the S-S procedures, to S-CSCF.</p> <p>28. P-CSCF indicates that the media flows authorized for this session should now be enabled.</p> <p>29. P-CSCF passes the 200-OK response back to UE.</p> <p>30. UE starts the media flow(s) for this session.</p> <p>31-33. UE responds to the 200 OK with an ACK message which is sent to P-CSCF and passed along the signalling path to the terminating end.”</p> <p>3GPP TS 23.228 V18.0.0 (2022-12) pp. 120-122.</p>
[1a] receiving a first message from an end user device at an application server to initiate a media session;	Receiving a first message from an end user device at an application server to initiate a media session takes place, for example, in steps 1-3:

Claim 1	Identification
	<p>“1. UE#1 sends the SIP INVITE request, containing an initial SDP, to the P-CSCF determined via the CSCF discovery mechanism. The initial SDP may represent one or more media for a multi-media session.</p> <p>2. P-CSCF remembers (from the registration procedure) the next hop CSCF for this UE. In this case it forwards the INVITE to the S-CSCF in the home network.</p> <p>3. S-CSCF validates the service profile, if a GRUU is received as the contact, ensures that the Public User Identity of the served user in the request and the Public User Identity associated with the GRUU belong to the same service profile, and invokes any origination service logic required for this user. This includes authorization of the requested SDP based on the user's subscription for multi-media services. If the Request URI contains the SIP representation of an E.164 address then the procedure specified in clause 4.3.5.3 applies.”</p> <p>The first message is, for example, the “INVITE message” as defined by the standard.</p>
[1b] forwarding the first message from the application server to a media server;	<p>Forwarding the first message from the application server to a media server takes place, for example, in step 4:</p> <p>“4. S-CSCF forwards the request, as specified by the S-S procedures. When the INVITE message includes priority indication, the S-CSCF forwards the INVITE, including the Service User's priority level if available.”</p> <p>“4.2.4 IP multimedia Subsystem Service Control Interface (ISC)</p> <p>The ISC interface is between the Serving CSCF and the service platform(s).</p> <p>An Application Server (AS) offering value added IM services resides either in the user's home network or in a third party location. The third party could be a network or simply a stand-alone AS.</p>

Claim 1	Identification
	<p>The Serving-CSCF to AS interface is used to provide services residing in an AS. Two cases were identified:</p> <ul style="list-style-type: none"> - Serving-CSCF to an AS in Home Network. - Serving-CSCF to an AS in External Network (e.g., Third Party or Visited) <p>The SIP Application Server may host and execute services. The SIP Application Server can influence and impact the SIP session on behalf of the services and it uses the ISC interface to communicate with the S-CSCF. The S-CSCF shall be able to supply the AS with information to allow it to execute multiple services in order within a single SIP transaction.</p> <p>The ISC interface shall be able support subscription to event notifications between the Application Server and S-CSCF to allow the Application Server to be notified of the implicit registered Public User Identities, registration state and UE capabilities and characteristics in terms of SIP User Agent capabilities and characteristics.</p> <p>The S-CSCF shall decide whether an Application Server is required to receive information related to an incoming initial SIP request to ensure appropriate service handling. The decision at the S-CSCF is based on (filter) information received from the HSS. This filter information is stored and conveyed on a per Application Server basis for each user. It shall be possible to include a service indication in the filter information, which is used to identify services and the order that they are executed on an Application Server within a single SIP transaction. The name(s)/address(es) information of the Application Server (s) are received from the HSS.”</p> <p>3GPP TS 23.228 V18.0.0 (2022-12) p. 31.</p> <p>“The purpose of optimal media routing (OMR) is to identify and remove unnecessary media functions from the media path for each media stream associated with a session. ...</p> <p>The OMR procedures have the following additional characteristics:</p>

Claim 1	Identification
	<ul style="list-style-type: none"> - They build on the ALG NAT traversal model that is an alternative to the ICE NAT traversal model. - They usually complete within a single end-to-end SDP offer/answer transaction. Some transcoding scenarios require additional signalling to complete optimisation. - They apply independently to each media stream established by an SDP offer/answer transaction. - They apply to media streams established between any types of endpoints (e.g., UEs, media servers, media gateways).” <p>3GPP TS 23.228 V18.0.0 (2022-12) p. 280.</p>
[1c] establishing the media session between the end user device and the media server;	Establishing the media session between the end user device and the media server takes place, for example, in steps 1-4 (<i>see</i> [1a] and [1b]).
[1d] initiating a first media transaction between the media server and the end user device via the application server using the media session;	<p>Initiating a first media transaction between the media server and the end user device via the application server using the media session takes place, for example, in steps 5-8:</p> <p>“5. The media stream capabilities of the destination are returned along the signalling path, per the S-S procedures.</p> <p>6. S-CSCF forwards the Offer Response message to P-CSCF.</p> <p>7. P-CSCF instructs the PCRF/PCF to authorize the resources necessary for this session.</p> <p>8. P-CSCF forwards the Offer Response message to the originating endpoint.”</p>

Claim 1	Identification
<p>[1e] conducting the first media transaction between the media server and the end user device via the application server using the media session, the first media transaction being conducted by transmitting a first media stream from the media server to the end user device via the application server and transmitting a second media stream from the end user device to the media server via the application server in response to the first media stream;</p>	<p>Conducting the first media transaction between the media server and the end user device via the application server using the media session, the first media transaction being conducted by transmitting a first media stream from the media server to the end user device via the application server takes place, for example, in steps 5-8 (<i>see</i> [1d]).</p> <p>And transmitting a second media stream from the end user device to the media server via the application server in response to the first media stream takes place, for example, in step 9.</p> <p>“9. UE decides the offered set of media streams for this session, confirms receipt of the Offer Response and sends the Response Confirmation to P-CSCF. The Response Confirmation may also contain SDP. This may be the same SDP as in the Offer Response received in Step 8 or a subset. If new media are defined by this SDP, a new authorization (as in Step 7) will be done following Step 14. The originating UE is free to continue to offer new media on this operation or on subsequent exchanges using the Update method. Each offer/answer exchange will cause the P-CSCF to repeat the Step 7 again.”</p>
<p>[1f] completing the first media transaction between the media server and the end user device via the application server using the media session;</p>	<p>Completing the first media transaction between the media server and the end user device via the application server using the media session takes place, for example, in steps 1-9 (<i>see</i> [1e]).</p>
<p>[1g] receiving a second message from the media server at the application server, the second message indicating that the first media transaction is complete;</p>	<p>Receiving a second message from the media server at the application server, the second message indicating that the first media transaction is complete takes place, for example, in steps 5-8:</p> <p>The second message is, for example, the “Offer Response message” as defined by the standard.</p>
<p>[1h] transmitting a third message from the application server to the media server to initiate a second media transaction between the media server and the end user device via the application server</p>	<p>Transmitting a third message from the application server to the media server to initiate a second media transaction between the media server and the end user device via the application server using the same media session used for the first media transaction takes place, for example, in steps 10-12:</p>

Claim 1	Identification
<p>using the same media session used for the first media transaction;</p>	<p>“10. Depending on the bearer establishment mode selected for the IP-CAN session, resource reservation shall be initiated either by the UE or by the IP-CAN itself. The UE initiates resource reservation procedures for the offered media as shown in Figure 5.15. Otherwise, the IP-CAN initiates the reservation of required resources after step 7.</p> <p>11. P-CSCF forwards this message to S-CSCF.</p> <p>12. S-CSCF forwards this message to the terminating endpoint, as per the S-S procedure.”</p> <p>The third message is, for example, the “Resource Reservation message” as defined by the standard.</p>
<p>[1i] conducting the second media transaction between the media server and the end user device via the application server using the same media session used for the first media transaction, the second media transaction being conducted by transmitting a third media stream from the media server to the end user device via the application server and transmitting a fourth media stream from the end user device to the media server via the application server in response to the third media stream;</p>	<p>Conducting the second media transaction between the media server and the end user device via the application server using the same media session used for the first media transaction, the second media transaction being conducted by transmitting a third media stream from the media server to the end user device via the application server takes places in steps 13-15:</p> <p>“13-14. The terminating end point responds to the originating end with an acknowledgement. If Optional SDP is</p> <p>contained in the Response Confirmation, the Confirmation Acknowledge will also contain an SDP response. If the SDP has changed, the PCSCF authorizes the media.</p> <p>15. PCSCF forwards the answered media towards the UE.”</p> <p>And transmitting a fourth media stream from the end user device to the media server via the application server in response to the third media stream takes place in steps 16-18:</p> <p>“16-18. When the resource reservation is completed, UE sends the successful Resource Reservation message to the terminating endpoint, via the signalling path established by the INVITE message. The message is sent first to P-CSCF.”</p>

Claim 1	Identification
[1j] completing the second media transaction between the media server and the end user device via the application server using the same media session used for the first media transaction; and	<p>Completing the second media transaction between the media server and the end user device via the application server using the same media session used for the first media transaction takes place, for example, in steps 16-18:</p> <p>“16-18 When the resource reservation is completed, UE sends the successful Resource Reservation message to the terminating endpoint, via the signalling path established by the INVITE message. The message is sent first to P-CSCF.”</p>
[1k] receiving a fourth message from the media server at the application server, the fourth message indicating that the second media transaction is complete.	<p>Receiving a fourth message from the media server at the application server, the fourth message indicating that the second media transaction is complete takes place, for example, in steps 19-21:</p> <p>“19-21. The terminating end point responds to the originating end when successful resource reservation has occurred.</p> <p>If the SDP has changed, the P-CSCF again authorizes that the resources are allowed to be used.”</p> <p>The fourth message is, for example, the “Reservation Conf” message in step 19 as defined by the standard.</p>